



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/055,310	01/22/2002	Hamid Noorbakhsh	4150D1/ETCH/DRIE/JB1	9294

32588 7590 10/15/2003

APPLIED MATERIALS, INC.
2881 SCOTT BLVD. M/S 2061
SANTA CLARA, CA 95050

EXAMINER

ALEJANDRO MULERO, LUZ L

ART UNIT	PAPER NUMBER
----------	--------------

1763

DATE MAILED: 10/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/055,310

Applicant(s)

NOORBAKSH ET AL.

Examiner

Luz L. Alejandro

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 January 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: reference number 350a. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: reference numbers: 152 (fig. 1), 350 (fig. 3), 132 (fig. 6). A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

The disclosure is objected to because of the following informalities: reference character "332" has been used to designate both a mating coupling (paragraph 0039) and a throttle valve (paragraph 0059). Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

Art Unit: 1763

art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 36-39 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

There is no support, in the specification, as originally filed, for a center member for substantially covering a bottom of the chamber, as required in independent claims 36 and 37. Note from Figure 3A that the center member is part of the lid.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 38-39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 38, lines 1-2, it is unclear how a center member used for covering the bottom of the chamber can be disposed proximate the lid which is used for covering the top of the chamber. Clarification is requested.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 36-37 are rejected under 35 U.S.C. 102(a) as being anticipated by Pu et al, WO 99/48130.

With respect to claims 36-37, the reference discloses a center member 10 having a first side adapted to be exposed to the processing region and coupled to end of the cylindrical wall; and a passage at least partially disposed in the center member and adapted to isolate a heat transfer fluid flowing therethrough from the processing volume (see page 11, lines 16-28 and fig. 1 and its description).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

Art Unit: 1763

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-3, 5, 7-12, 14-17, 20-23, 25-26, 28-31, and 33-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shan et al., EP 0 814 495 in view of Lee, U.S. Patent 5,616,208.

Shan et al. shows the invention as claimed including: an aluminum base 22; a removable cylindrical inner wall/liner 10; a passage 23 in the inner wall having an inlet and an outlet; an outer wall 20 comprising a pumping port 50; a center member (top center part of member 10); a flange (top outer part of member 10); wherein the inner wall is cylindrical and projects from the center member inside of the flange and a passage disposed in the center member having an inlet and an outlet (see fig. 1); a lid 24 disposed opposite the cylindrical wall, the lid and the wall defining a plenum at least partially therebetween (see fig. 1); a plurality of nozzles disposed in the center member providing fluid access to the plenum; a gas feedthrough fluidly coupled to the plenum through a hole disposed in the lid (see page 4, lines 25-27). For a complete description of the apparatus see fig. 1, page 3-line 20 to page 4-line 45, and page 9, lines 7-46.

Shan et al. fails to expressly disclose a substantially annular passage formed in the base or center member, and having an inlet and an outlet adapted to circulate a fluid through the passage, wherein the passage is fluidly isolated from the processing volume. Lee discloses using an annular heat medium passage (123,129) formed so as to prevent deposition on the surfaces exposed to plasma (see fig. 1 and its description).

Art Unit: 1763

In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Shan et al. so as to control the temperature of the surfaces exposed to the gases (plasma) because this will prevent the deposition of by-products on the exposed walls.

Claims 4 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shan et al., EP 0 814 495 in view of Lee, U.S. Patent 5,616,208 as applied to claims 1-3, 5, 7-12, 14-17, 20-23, 25-26, 28-31, and 33-39 above, and further in view of Collins et al., EP 0 807 953 A1.

Shan et al. and Lee are applied as above but does not expressly disclose a magnet disposed in the inner wall. Collins et al. discloses the use of magnets 80/82 in walls of the apparatus for plasma confinement. In view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Shan et al. modified by Lee as to further comprise a magnet disposed in the inner wall in order to confine the plasma.

Claims 6, 13, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shan et al., EP 0 814 495 in view of Lee, U.S. Patent 5,616,208 as applied to claims 1-3, 5, 7-12, 14-17, 20-23, 25-26, 28-31, and 33-39 above, and further in view of Reimold et al., DE 31 10489 A1.

Shan et al. and Lee are applied as above but do not expressly disclose the use of bosses. Reimold discloses the use of bosses for providing connection for the supply

Art Unit: 1763

or the removal of a heat exchanging medium (see equivalent abstract). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use bosses in the apparatus of Shan et al. modified by Lee in order to provide connection for the supply and removal of the heat exchanging medium.

Claims 24 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shan et al., EP 0 814 495 in view of Lee, U.S. Patent 5,616,208 as applied to claims 1-3, 5, 7-12, 14-17, 20-23, 25-26, 28-31, and 33-39 above, and further in view of Banholzer et al., U.S. Patent 5,565,058.

Shan et al. and Lee are applied as above but do not expressly disclose that the liner comprises a textured surface. Banholzer et al. discloses a vacuum chamber comprising a liner that is treated to roughen its surface to create a textured surface for increasing adhesion of materials deposited thereon during substrate processing. Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Shan et al. modified by Lee as to texture the interior surface of the liner in order to increase adhesion of materials deposited thereon during substrate processing.

Claims 1-3, 5, 11-12, 14-17, 20-23, 25-26, 28-31, and 33-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shan et al., EP 0 814 495 in view of Masuda et al., U.S. Patent 6,171,438.

Shan et al. shows the invention as claimed including: an aluminum base 22; a removable cylindrical inner wall/liner 10; a passage 23 in the inner wall having an inlet and an outlet; an outer wall 20 comprising a pumping port 50; a center member (top center part of member 10); a flange (top outer part of member 10); wherein the inner wall is cylindrical and projects from the center member inside of the flange and a passage disposed in the center member having an inlet and an outlet (see fig. 1); a lid 24 disposed opposite the cylindrical wall, the lid and the wall defining a plenum at least partially therebetween (see fig. 1); a plurality of nozzles disposed in the center member providing fluid access to the plenum; a gas feedthrough fluidly coupled to the plenum through a hole disposed in the lid (see page 4, lines 25-27). For a complete description of the apparatus see fig. 1, page 3-line 20 to page 4-line 45, and page 9, lines 7-46.

Shan et al. fails to expressly disclose a substantially annular passage formed in the base, and having an inlet and an outlet adapted to circulate a fluid through the passage, wherein the passage is fluidly isolated from the processing volume. Masuda et al. discloses an apparatus comprising a liner 103 having a heat exchanging medium supply means 104 to control the temperature of the side wall 102. In view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Shan et al. by supplying a heat transfer medium through the liner because this allows for the formation of a strong polymerized film on the exposed walls.

Claims 4 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shan et al., EP 0 814 495 in view of Masuda et al., U.S. Patent 6,171,438 as applied to claims 1-3, 5, 11-12, 14-17, 20-23, 25-26, 28-31, and 33-39 above, and further in view of Collins et al., EP 0 807 953 A1.

Shan et al. and Masuda et al. are applied as above but does not expressly disclose a magnet disposed in the inner wall. Collins et al. discloses the use of magnets 80/82 in walls of the apparatus for plasma confinement. In view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Shan et al. modified by Masuda et al. as to further comprise a magnet disposed in the inner wall in order to confine the plasma.

Claims 6, 13, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shan et al., EP 0 814 495 in view of Masuda et al., U.S. Patent 6,171,438 as applied to claims 1-3, 5, 11-12, 14-17, 20-23, 25-26, 28-31, and 33-39 above, and further in view of Reimold et al., DE 31 10489 A1.

Shan et al. and Masuda et al. are applied as above but do not expressly disclose the use of bosses. Reimold discloses the use of bosses for providing connection for the supply or the removal of a heat exchanging medium (see equivalent abstract). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use bosses in the apparatus of

Shan et al. modified by Masuda et al. in order to provide connection for the supply and removal of the heat exchanging medium.

Claims 24 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shan et al., EP 0 814 495 in view of Masuda et al., U.S. Patent 6,171,438 as applied to claims 1-3, 5, 11-12, 14-17, 20-23, 25-26, 28-31, and 33-39 above, and further in view of Banholzer et al., U.S. Patent 5,565,058.

Shan et al. and Masuda et al. are applied as above but do not expressly disclose that the liner comprises a textured surface. Banholzer et al. discloses a vacuum chamber comprising a liner that is treated to roughen its surface to create a textured surface for increasing adhesion of materials deposited thereon during substrate processing. Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Shan et al. modified by Masuda et al. as to texture the interior surface of the liner in order to increase adhesion of materials deposited thereon during substrate processing.

Claims 7-10 and 36-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shan et al., EP 0 814 495 in view of Miyamoto, U.S. Patent 5,846,331.

Shan et al. shows the invention as claimed including: an aluminum base 22; a removable cylindrical inner wall/liner 10; a passage 23 in the inner wall having an inlet

Art Unit: 1763

and an outlet; an outer wall 20 comprising a pumping port 50; a center member (top center part of member 10); a flange (top outer part of member 10); wherein the inner wall is cylindrical and projects from the center member inside of the flange and a passage disposed in the center member having an inlet and an outlet (see fig. 1); a lid 24 disposed opposite the cylindrical wall, the lid and the wall defining a plenum at least partially therebetween (see fig. 1); a plurality of nozzles disposed in the center member providing fluid access to the plenum; a gas feedthrough fluidly coupled to the plenum through a hole disposed in the lid (see page 4, lines 25-27). For a complete description of the apparatus see fig. 1, page 3-line 20 to page 4-line 45, and page 9, lines 7-46.

Shan et al. fails to expressly disclose a substantially annular passage formed in the center member, and having an inlet and an outlet adapted to circulate a fluid through the passage, wherein the passage is fluidly isolated from the processing volume. Miyamoto discloses forming a substantially annular passage 5 in a center member, and having an inlet and an outlet adapted to circulate a fluid through the passage, where the passage is isolated from the processing volume (see fig. 2 and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Shan et al. so as to include the annular passage of Miyamoto because this will allow for controllability of the temperature of the upper portion of the chamber.

Claims 1-3, 5, 11-12, 14-17, 20-23, 25-26, 28-31, 33-35, and 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Masuda et al., U.S. Patent 6,171,438.

Pu et al. shows the invention as claimed including: an aluminum base 14; a removable cylindrical inner wall/liner 26; a gas passage in the inner wall having an inlet and an outlet (see page 5, lines 10-11); an outer wall 12 comprising a pumping port 24. For a complete description of the apparatus see fig. 1, page 4-line 14 to page 5-line 11 and page 11, lines 16-28).

Pu et al. fails to expressly disclose a substantially annular passage formed in the base or center member, and having an inlet and an outlet adapted to circulate a fluid through the passage, wherein the passage is fluidly isolated from the processing volume. Masuda et al. discloses an apparatus comprising a liner 103 having a heat exchanging medium supply means 104 to control the temperature of the side wall 102. In view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Pu et al. by supplying a heat transfer medium through the liner because this allows for the formation of a strong polymerized film on the exposed walls.

Claims 4 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Masuda et al., U.S. Patent 6,171,438 as applied to claims 1-3, 5, 11-12, 14-17, 20-23, 25-26, 28-31, 33-35, and 38-39 above, and further in view of Collins et al., EP 0 807 953 A1.

Pu et al. and Masuda et al. are applied as above but does not expressly disclose a magnet disposed in the inner wall. Collins et al. discloses the use of magnets 80/82 in walls of the apparatus for plasma confinement. In view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Pu et al. modified by Masuda et al. as to further comprise a magnet disposed in the inner wall in order to confine the plasma.

Claims 6, 13, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Masuda et al., U.S. Patent 6,171,438 as applied to claims 1-3, 5, 11-12, 14-17, 20-23, 25-26, 28-31, 33-35, and 38-39 above, and further in view of Reimold et al., DE 31 10489 A1.

Pu et al. and Masuda et al. are applied as above but do not expressly disclose the use of bosses. Reimold discloses the use of bosses for providing connection for the supply or the removal of a heat exchanging medium (see equivalent abstract). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use bosses in the apparatus of Pu et al. modified by Masuda et al. in order to provide connection for the supply and removal of the heat exchanging medium.

Claims 24 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Masuda et al., U.S. Patent 6,171,438 as applied

Art Unit: 1763

to claims 1-3, 5, 11-12, 14-17, 20-23, 25-26, 28-31, 33-35, and 38-39 above, and further in view of Banholzer et al., U.S. Patent 5,565,058.

Pu et al. and Matsuda et al. are applied as above but do not expressly disclose that the liner comprises a textured surface. Banholzer et al. discloses a vacuum chamber comprising a liner that is treated to roughen its surface to create a textured surface for increasing adhesion of materials deposited thereon during substrate processing. Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Pu et al. modified by Masuda et al. as to texture the interior surface of the liner in order to increase adhesion of materials deposited thereon during substrate processing.

Claims 7-10 and 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Shan et al., EP 0 814 495 and further in view of Miyamoto, U.S. Patent 5,846,331.

Pu et al. is applied as above but does not expressly disclose the claimed structural limitations including a substantially annular passage formed in the center member, and having an inlet and an outlet adapted to circulate a fluid through the passage, wherein the passage is fluidly isolated from the processing volume. Shan et al. discloses an apparatus having a center member being circumscribed by a flange and from which a cylindrical wall 10 projects, wherein the lid is disposed so as to define a plenum with the wall from which a fluid is coupled to the processing volume through

Art Unit: 1763

plurality of nozzles (see fig. 1 and page 3-line 20 to page 4-line 45, and page 9, lines 7-46). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Pu et al. as to comprise the center member/lid/gas supply structure taught by Shan et al. in order to optimize the apparatus since such arrangement will provide for a more uniform distribution of the gas(es) into the chamber and towards the substrate.

With respect to the annular passage, Miyamoto discloses forming a substantially annular passage 5 in a center member, and having an inlet and an outlet adapted to circulate a fluid through the passage, where the passage is isolated from the processing volume (see fig. 2 and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Pu et al. modified by Shan et al. so as to include the annular passage of Miyamoto because this will allow for controllability of the temperature of the upper portion of the chamber.

Claims 1-3, 5, 11-12, 14-17, 20-23, 25-26, 28-31, 33-35, and 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Lee, U.S. Patent 5,616,208.

Pu et al. is applied as above but fails to expressly disclose a substantially annular passage formed in the base or center member, and having an inlet and an outlet adapted to circulate a fluid through the passage, wherein the passage is fluidly isolated from the processing volume. Lee discloses using an annular heat medium passage

(123,129) formed so as to prevent deposition on the exposed surfaces of the chamber (see fig. 1 and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Pu et al. so as to control the temperature of the surfaces of the chamber exposed to the chamber gases because this will prevent the deposition of by-products on the exposed walls.

Claims 4 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Lee, U.S. Patent 5,616,208 as applied to claims 1-3, 5, 11-12, 14-17, 20-23, 25-26, 28-31, 33-35, and 38-39 above, and further in view of Collins et al., EP 0 807 953 A1.

Pu et al. and Lee are applied as above but does not expressly disclose a magnet disposed in the inner wall. Collins et al. discloses the use of magnets 80/82 in walls of the apparatus for plasma confinement. In view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Pu et al. modified by Lee as to further comprise a magnet disposed in the inner wall in order to confine the plasma.

Claims 6, 13, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Lee, U.S. Patent 5,616,208 as applied to claims 1-3, 5, 11-12, 14-17, 20-23, 25-26, 28-31, 33-35 and 38-39 above, and further in view of Reimold et al., DE 31 10489 A1.

Pu et al. and Lee are applied as above but do not expressly disclose the use of bosses. Reimold discloses the use of bosses for providing connection for the supply or the removal of a heat exchanging medium (see equivalent abstract). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use bosses in the apparatus of Pu et al. modified by Lee in order to provide connection for the supply and removal of the heat exchanging medium.

Claims 24 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Lee, U.S. Patent 5,616,208 as applied to claims 1-3, 5, 11-12, 14-17, 20-23, 25-26, 28-31, 33-35 and 38-39 above, and further in view of Banholzer et al., U.S. Patent 5,565,058.

Pu et al. and Lee are applied as above but do not expressly disclose that the liner comprises a textured surface. Banholzer et al. discloses a vacuum chamber comprising a liner that is treated to roughen its surface to create a textured surface for increasing adhesion of materials deposited thereon during substrate processing. Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Pu et al. modified by Lee as to texture the interior surface of the liner in order to increase adhesion of materials deposited thereon during substrate processing.

Claims 7-10 and 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Shan et al., EP 0 814 495 and further in view of Masuda et al., U.S. Patent 6,171,438.

Pu et al. is applied as above but does not expressly disclose the claimed structural limitations including a substantially annular passage formed in the center member, and having an inlet and an outlet adapted to circulate a fluid through the passage, wherein the passage is fluidly isolated from the processing volume. Shan et al. discloses an apparatus having a center member being circumscribed by a flange and from which a cylindrical wall 10 projects, wherein the lid is disposed so as to define a plenum with the wall from which a fluid is coupled to the processing volume through plurality of nozzles (see fig. 1 and page 3-line 20 to page 4-line 45, and page 9, lines 7-46). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Pu et al. as to comprise the center member/lid/gas supply structure taught by Shan et al. in order to optimize the apparatus since such arrangement will provide for a more uniform distribution of the gas(es) into the chamber and towards the substrate.

With respect to the annular passage, Masuda et al. discloses an apparatus comprising a liner 103 having a heat exchanging medium supply means 104 to control the temperature of the side wall 102. In view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Pu et al. by supplying a heat transfer medium through the liner because this allows for the formation of a strong polymerized film on the exposed walls.

Response to Arguments

Applicant's arguments with respect to claims 1-39 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 703-305-4545. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on 703-308-1633. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Luz L. Alejandro
Primary Examiner
Art Unit 1763

October 6, 2003